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### **Use of Aggressive Lower Respiratory Secretion Clearance in Children With Muscle Weakness and Tracheostomy: A Pilot Study**

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**PURPOSE:** Children with muscle weakness (MW) suffer from insufficient airway secretion clearance (ASC), predisposing them to lower respiratory tract infections (LRTI) and significantly increasing their morbidity. The presence of a tracheostomy promotes bacterial colonization and infections of the lower airway tract. This is a prospective study assessing the efficacy and financial feasibility of aggressive ASC in children with MW and tracheostomy.

**METHODS:** Aggressive ASC was initiated in six subjects with tracheostomy and MW related to cerebral palsy or other genetic syndromes. Subjects were treated with twelve months of twice daily use of cough-assist mechanical insufflatorexsufflator (CA) and high-frequency chest wall oscillation (HFCWO) for airway clearance routinely; increased to four times daily during LRTI. Outcome measures included the cost of hospitalizations, emergency department visits and antibiotic use, as well as, the number of hospitalizations before and after intervention.

**RESULTS:** Implication of aggressive ASC led to a trend in the reduction of hospitalizations ( $1.83 \pm 1.94$  vs.  $0.5 \pm 0.8$ ,  $P=0.082$ ). Each of the 5 subjects showed 82%, 55%, 100%, 57%, and 99% cost reduction respectively following the intervention.

**CONCLUSION:** Aggressive ASC which consists of use of CA and HFCWO showed a consistent trend towards reduction in cost of treatment and numbers of hospitalizations, which may be statistically significant with an increase in sample size.

**CLINICAL IMPLICATIONS:** Aggressive ASC should be strongly recommended in children with MW and tracheostomy.

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